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Amid War, Recession, and Deficit

Science Faces Tough Times as Budget Season Opens

At their loudest in many years, complaints of hardship and neglect in the scientific community have caught political attention in Washington, with both Congress and the White House in harmony on the importance of maintaining a vigorous scientific enterprise. It's tempting, then, to feel confident that long-overdue remedial spending will at last be forthcoming.

Alas, the more realistic prospect is that when the appropriation bills start coming out of the Congressional labyrinth next spring, the gains for science, big and little, will at best be modest, perhaps a few points above inflation. But given the costs and uncertainties of the Gulf war, the recession, a soaring deficit, and pent-up social demands, science budgets might not fare that well under the new budgeting rules, which establish a zero-sum system.

White House sources tell SGR that respectable increases for the research agencies are included in the budget that the

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President will send to Congress next week for the fiscal year that begins next October 1. That budget, however, was written before the outbreak of war and in the expectation that the economic downturn would be brief and shallow.

While the Administration insists that the economy will right itself without Washington's intervention, Congressional Democrats are straining for anti-recession spending and help for the needy. As things are non-rationally organized in Capitol Hill's patchwork of committee jurisdictions, the needy and a good chunk of federally supported science are in direct competition for the same pot of money.

Congress always allows itself various escapes, formal and informal, from its iron-bound pledges of budget discipline—though always starting next year. In one way or another, it can slither out of the budget vise that it has adopted to control "discretionary" spending. That's the money that the government, theoretically, may or may not spend, as distinguished from statutory requirements that establish Social Security, farm supports, and other programs as non-discretionary. Science money, however, is discretionary, which means an annual struggle for shares.

Under the budget agreement, discretionary spending is set in three separate pools for the current fiscal year, 1991, through 1993: domestic, international, and defense (excluding the Gulf War, which is separately budgeted). The growth of these pools is "capped" at approximately the rate of inflation. Thus, outlays in the domestic pool, which total $182 billion this year, may rise to no more than $210 billion in fiscal 1992 and $221.7 billion in 1993.

The walls between the pools are inviolate, which means domestic spending cannot profit, at least directly, by trim-

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In Brief

Like many others going from the upper administrative levels of academe to senior federal jobs, Walter Massey will suffer a big financial loss when he leaves a Vice Presidency at the University of Chicago to become Director of NSF, with a salary of $125,100. According to the Financial Disclosure Report required of Presidential appointees, Massey was paid $168,000 last year by Chicago, and he received $223,318 in various corporate director's fees. If confirmed, which is sure, he'll take leave from Chicago and resign the corporate posts.

The Washington policy circuit regularly resounds with concerns about federal technology policy as a major factor in US industrial woes. But according to an NSF survey of members of the Industrial Research Institute, "Federal Technology Policy was judged to have the least impact on the ability of the US to maintain its technological supremacy." Cited as the biggest problems were "General Management Practices" and "External Financial Pressures." The NSF report, "Potential Causes for the Erosion in US Technology Leadership," is available without charge from: NSF, 1800 G St. NW (L-602), Washington, DC 20550; attn. Melissa Pollak; tel. 202/634-4648.

Due in April from the Congressional Office of Technology Assessment: a cool, unsentimental report on federal support of basic research, unencumbered by the heartfelt faith of the elders of science that more can only be better, and don't ask too many questions. Among the topics covered are priority-setting in science and various possibilities for coping with rising research expenditures. The science establishment has traditionally shown little interest in these subjects, preferring instead to demand increases in federal support. Also included in the coming OTA report are a discussion of how other countries support science and data on the US system.

. . . Fiscal Reality Now Crimping the Mega-Projects

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ming foreign aid or defense. Big growth requires going predatory within the pool, but more exactly, within the share of the pool alloted to a particular appropriations subcommittee. This setup has repeatedly frustrated the financial-growth aspirations of the National Science Foundation, which for budget purposes on Capitol Hill is bundled with the Department of Housing and Urban Development and the Department of Veterans Affairs. Also in that group are NASA and the Environmental Protection Agency, both politically more appealing than NSF.

The Foundation regularly reaps Presidential and Congressional praise, only to find its budget trimmed at the last moment to cover a shortfall in funds for urgent social needs or another NASA over-run. Even so, NSF fared better than most last year. It didn't get the 14 percent increase requested by the White House, but when the final returns were in, it received a 9.2 percent boost—not bad in a difficult year, but small when measured against the laudatory rhetoric that NSF routinely receives from its political admirers.

The Bush Administration has shunned priority-making in science, especially on the so-called mega-projects, on the cheerful assumption that somehow or other, the US will be able to afford it all. Fiscal reality, however, is rapidly closing in. Despite the discretion required of Presidential Science Advisers, D. Allan Bromley sounded uncertain, even pessimistic, about the future of the Superconducting Super Collider in his recent interview in SGR [January 15: "Bush's Science Chief on Prospects and Policies for '91"]. And Congress, unable to abide NASA's undisciplined appetite for money for the Space Station, finally cracked down last year. While boosting the overall NASA budget, it lopped nearly $500 million from the Space Station request and directed NASA to adopt a more modest design.

With a political lifeline that bypasses the White House and runs directly to Capitol Hill, the National Institutes of Health came out of last year's budget chaos with a 9.6 percent increase. That was double the growth requested by the White House, but still not enough to satisfy NIH's great ranks of clamoring clients. Will NIH do better this year? Don't count on it, though the biomedical establishment's mighty lobbying apparatus is poised for battle, in close alliance with its Congressional friends.

On February 4, directly after the Department of Health and Human Services holds its customary press briefing on the budget, the Coalition for Health Funding, comprising over 200 health-related organizations, will hold its briefing for the press. Included in the Coalition are the many organizations in the NIH lobby, the Ad Hoc Group for Medical Research Funding, which is orchestrated by the Association of American Medical Colleges. The site of the Coalition briefing is a big hearing room in the House Rayburn Building, thoughtfully made available by Congressional friends of health spending. An announcement from the Coalition says various speakers "will react to the Administration's proposal, identify unmet needs and describe the likely impact of Administration recommendations."

Science will need all the noise and attention it can generate when Congress weighs its budgetary fate. Amid war, recession, and poverty, politics can easily overlook science's pleas for more money.—DSG

APS Council Challenges SSC and Space Station

The leaders of science have long sought to prevent financial privation from breeding disharmony within and among disciplines. But when money is short, covetous looks can't be prevented. That was the case when life scientists tried to strangle NIH's designs for the human genome project. They initially failed, but later succeeded in holding down genome appropriations. Now physicists are in open rebellion against two financially ravenous mega-projects that they regard as threats to other needs of science, the Superconducting Super Collider and the Space Station.

In statements adopted January 20, the Council of the American Physical Society declared that research funding is inadequate and that "Reversing this trend and strengthening the support for individual investigators must have the highest priority." The SSC is a commendable project, the Council continued, but its funding "must not be at the expense of the broadly based scientific research program of the US." As for the Space Station, the Council said that, contrary to "public and governmental misunderstanding," it lacks "scientific justification." The US "needs a vigorous space science program," the Council added, "but such a program can be implemented for the foreseeable future without the proposed space station."

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Q&A With Walter Massey, Nominee to Head NSF

Walter Massey, Vice President for Research of the University of Chicago and for the Argonne National Laboratory, went on a six-month sabbatical last summer to study technology transfer in Europe. While Massey was abroad, President Bush offered him the Directorship of the National Science Foundation. Massey accepted, on the condition that he could complete the sabbatical. With Senate confirmation a certainty, but a hearing not yet scheduled, he'll probably take office early in March. Massey spoke with SGR Editor Greenberg in Paris on December 28, with only NSF matters out of bounds, in deference to the custom of nominees giving the Senate first crack on questions about the agency they'll head. Following is the text of the conversation, transcribed and edited by SGR.

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SGR. *What do they seem to know about technology transfer here that we could profit from?*

Massey. I've been very impressed with some of the things they've managed to do that we have had difficulty doing. The CNRS (*Centre de la Recherche Scientifique*, roughly the French counterpart of NSF) has a concept called mixed laboratories in which they jointly fund groups of researchers working with industrial scientists on fairly focused research projects. Industry also sponsors postdocs to work in CNRS labs and mixed laboratories.

SGR. *Does that bear some resemblance to NSF's Engineering Research Centers?*

Massey. No, the NSF centers are on university campuses. They may or may not attract industrial funding for the research, though that's the idea, and they vary in quality. The NSF concept is not that industry scientists will actually work in the labs alongside university or lab scientists. And that's what's different about the French system.

SGR. *Are the Europeans you've met as dismayed as our people are about adequacy of funding?*

Massey. The situation is not as public as it is in the United States. I don't see articles in the French press like we have in the *New York Times*. But when you have discussions with individuals, and you ask is this an issue here, they say, yes, it is. But one of the impressive things, especially given what we've gone through with this year's budget, is the relative stability that they have in budgetary planning because of the strong role of the executive [branch of government]. They can fairly well count on a four- or five-year plan being implemented. People feel very comfortable in the laboratories. If the government says this is going to be funded, it will be. On the other hand, a large percentage of those funds are tied up in salaries. Salaries are a line item in the national budget. Each position is named. So, actually, they have stability, but they give up a lot of flexibility.

SGR. *Has our own pessimism about the state of American science affected the perceptions of Europeans you've met?*

Massey. I'm impressed by the strong degree to which the United States is still very much respected. We seem to have much more respect abroad for our institutions than some people give ourselves credit for in the United States. We lament a great deal about the status of science, which is seen to be our strength over here. Things are well-planned and stable here. But in the US the individual researcher has a great freedom, the universities have a great amount of independence themselves. The National Science Foundation gets a great deal of respect here in Europe. And the quality of science is still seen to be the standard of excellence in science.

SGR. *In the U.S., some see Europe '92 as an opportunity for greater scientific collaboration. Some fear a Fortress Europe will develop against the US.*

Massey. I think it's much more the former. I detect nothing of the Fortress Europe mentality. I've spoken to people in industry as well as in the universities. Most of the firms—I've interviewed about 10 or 12 of the major companies—see this as an opportunity to become more international, and in fact see this as giving them a base so they can now expand and compete within the continental United States or South America or the Far East. The closing of Europe—I read about that before I came here, but I haven't picked that up anywhere, especially not against the United States.

The desire to have a European community seems to be much stronger. This comes to me from the French, who you'd think would be the last to want to go in this direction. It seems to be for real. You ask individuals how do they see the future, do they see it moving in this direction, and they say it's inevitable. The year 1992 is not a magic date for most things now, because the feeling is that most of the barriers are down. And things are moving inevitably and nothing magic will happen on that date. Companies, individuals have already anticipated it and they're all moving ahead.

SGR. *Erich Bloch [former Director of NSF] and others have raised the possibility that European students will now find that, instead of coming to the United States, they can find excellent training opportunities in Europe.*

Massey. That was one thing I had on my list to pursue. I think we probably ought to be concerned about this, not because the Europeans would wish it to happen, but we may inadvertently cause it if we don't provide the proper mechanisms. Because it certainly will be easier for them to move through Europe. But the feeling now is that the United States will remain the standard, and if not the mecca, at least the major attraction for good people. Unless we do something ourselves to prevent this.

SGR. *American universities will still be the world standard?*

Massey. That's the feeling here. One might think that

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. . . US Should Seek Closer European Science Ties

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the cultural differences between the European countries and the United States would be greater than the differences within Europe. But it's not perceived that way, especially in science. English is the *lingua franca* of science. And so, a French student finds it easier to go to the United States than to Germany. I'm less concerned about that being something that the Europeans would desire to bring about, and I'm more concerned that we could inadvertently promote it or make it difficult for them to come to the United States.

SGR. *Often their governments or companies provide resources. Our universities don't have the money to bring them.*

Massey. That's going to be a question: Whether or not there would be some economic incentives that will increase the motivation to stay within Europe that will outweigh what is now perceived to be the scientific advantages of studying in the US.

SGR. *Europe has a program called* Erasmus *that subsidizes students from one European country to study in another European country.*

Massey. It's in its early stages. It looks positive, but it's too early to evaluate. The thing one can do in the program is have short visits, which doesn't require a scientist or student actually to find a longterm residence or move. But for extended periods, for months or years, the United States is still the most popular. A preliminary assessment by people who have studied mobility at CNRS is that what may happen is that the United States could benefit once people begin to travel within Europe. Then they begin to see the advantages of traveling and going abroad. Also, they get the confidence to do it.

SGR. *A lot of the national research authorities are resistant to an expansion of the European Commission's role.*

Massey. I think that's probably right. But it's clearly going to become more important. It already has become more important. My impression from speaking to the people in England is that the EC programs are much more important to them. It has to do with the fact their [domestic] funding has not been as strong as French funding for research. And so, university and lab scientists there participate very actively in EC programs and see it as an important part. The French see it as important, but not as important. But these programs provide mechanisms for collaboration across borders that would probably not have happened had it not been for them. So, they're at the margin in terms of the amount of money spent, but seem to be very important in doing things that are difficult to do within the national budgets.

SGR. *What have you observed about Europe's dealing with the educational "pipeline" problem?*

Massey. One thing that everyone seems to agree on is that they do not yet have the problems of precollege education that we have in terms of the quality. That's a refreshing thing. It's so different. They have a fairly good sense of confidence in the schools. In France and England, the average schools seem to be pretty good. At least they're not lamenting about the problems that we have.

SGR. *They don't have these forecasts of terrible shortages of scientists and engineers around the turn of the century?*

Massey. No, except in terms of population. They are facing, not a decline, but a lack of substantial growth in the population. That factor will affect supply. But it doesn't seem to be the same type of concern, that the students are not prepared.

SGR. *What have you learned about laboratories here comparable to our national laboratories? Do they also have a lot of handwringing about institutions long surviving their original purposes?*

Massey. We go through that periodically in the United States. Every five or six years, there's a call for a review of the old mission. And I guess we're getting that now, especially in the weapons labs. I think they have gone through that, to a large degree. In England, they have reached a decision that these institutions are going to have to earn more and more of their income by competing with the private sector and selling their research. The debate in that sense is almost over. Places like Harwell [laboratory of the UK Atomic Energy Authority] are becoming like Battelles [the for-profit contract research organization, headquartered in Ohio]. Here, the CNRS dominates the physical sciences in terms of the laboratories they run. There are a few concerns as to whether the CNRS is too dominant. But when I say, "Do you think there's going to be any serious alterations?" they're not heading for that. Actually, if you speak to the French, most of them who are involved in positions of science, or in government or in industry have a fairly healthy respect for the quality of science done at these institutions. That's because unlike our system, where most of the research is in the universities, here, in fact, most of the research is in CNRS or INSERM [*Institut National de la Sante et de la Recherche Medicale]* or IFREMER [*Institut Francais pour l'Exploitation de la Mer*].

SGR. *Is there a lesson that we should move research out of the universities?*

Massey. No, they look at us, and they would like to strengthen their universities and have a stronger research base at more universities.

SGR. *Do you see any additional opportunities for large scale collaborations between the U.S. and Europe?*

Massey. I don't think we have any choice but to look for the greatest cooperation and collaboration. What I think we might have to be concerned about is that the European Community, as it becomes more and more cohesive, will be able to carry out these largescale projects without us. I was down to Grenoble to the synchrotron source at ILL [*Institut*

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. . . US Must Sustain Its World Lead in Research

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Laue-Langevin], and they seem to do a very good job in these international collaborations. One thing that was pointed out, especially at Grenoble, is that because these [international facilities] are based on what are almost treaties between countries, that once the funding is promised, it's a deal. If it's one country, it can say, "We can't afford it," and back out. But if it's more than one country, even at the risk of domestic sacrifices, there's a commitment. And that gives them a kind of stability.

SGR. *They're trying hard to encourage the entrepreneurial spirit in the research community.*

Massey. They're trying very hard. There are a few very successful entrepreneurs, and there are some laboratories, such as in informatics and computer software, that have avowed goals and strong programs for transferring technology by setting up and encouraging new businesses. But it's just very difficult to get people to do this, because they don't see any examples of successes to emulate. And they see numerous examples where failure does not result in the attitude that, well, we gave it a try, we'll learn from that, and try again. Failure is not respected. Bankruptcy is, maybe, the ultimate shame. It's certainly hard to go back and get another loan from a bank.

What's very interesting is that the [French] atomic energy agency, [*Commissariat a l'Energie Atomique*] has a venture-capital arm. They actually have one on their own, and then they have one jointly with one of the large banks in French. But the idea that a government agency, like the [US] Department of Energy or DOD, would have its own venture-capital arm is something that—.

SGR. *The closest thing we have is probably the SBIR [Small Business Innovation Research program, under which most federal agencies are required to allot 1.25 percent of external research funds to small firms].*

Massey. The difference is that the French agency takes an equity position. But even though there is not a great deal of venture capital [in Europe], that doesn't seem to be the limiting factor right now. The limiting factor seems to be simply whether or not it seems to be worth it to pursue an independent career when you have a job, and you have a job for life. There are some places with the old Silicon Valley spirit. Down near Grenoble, certainly, and in England, around Cambridge, there are a number of small companies; it's a rather booming entrepreneurial area. But it's not at the scale of the US.

SGR. *How do salaries for scientists compare, let's say for 40-year-old professors here and in the US?*

Massey. They are low in Europe. The salary here would be about 60 percent of ours. However, no one here is saving to send their kids to college. The pensions are funded in a totally different way. A lot of things are subsidized by the government. It's hard to make comparisons just on salary, but taking all of those things, the salaries are maybe about 80 percent of those in the United States.

SGR. *Is the salary scale impinging on the quality of science by causing people to make different career decisions?*

Massey. I hear different responses to that. One is that the salary scales now may be a big factor in deterring bright young people from entering science because they can make more money in other fields. On the other hand, there's a feeling that, well, the salaries are low, but you've got all these other things, and there's a certain stability. If someone wants to do science, then it's not a bad system, because you don't worry constantly about applying for grants. You don't spend all of your time as a senior or even middle-level person writing proposals. The research money goes to the laboratory, rather than to the individual. So, that's one of those tradeoffs.

SGR. *Do we have a lesson to learn from this block funding?*

Massey. We've debated that in the United States since they set up the Materials Research Centers in the National Science Foundation, as to whether or not one should give block funds or they should all be competitive for individuals in small programs. I think you need a mix, depending upon the discipline, the record of the institution, the system for reviewing it. I think it would be unhealthy to get to a point where block funding just went on independent of quality and reached a point where it became a right. But the fact that we do seem to have the highest quality research in science in the world obviously has a lot to do with the system we have. One can't get away from that—the competitive system.

SGR. *It's hell for the people in it.*

Massey. It is hell, certainly when there's not enough money. There should always be not quite enough funding for all applicants, because clearly you want to have quality. But when there's so little, then you reach a point of diminishing returns.

SGR. *What's the remedy?*

Massey. I think we need more funding, more money in some areas.

SGR. *There is no more money in the present budget situation.*

Massey. Well, I don't know. There's always more money. Somewhere. It really would be a major tragedy if we do not sustain one of the areas of excellence where it is agreed on universally that we set the standard for the world. That's in the quality of our fundamental research, our research in universities and other institutions. We are worried about our precollege education system, our ability to compete in the marketplace, where we stand in the world by various other standards. Here's the one thing where we're clearly in the lead. If we don't protect that, I think it would be a national disgrace. So, even if there's no more money, somehow we have to find a way to make sure we put adequate resources there. Also, we have to use resources more wisely.

Response Due on Zapping of NIH Fraud Regulations

The Office of Scientific Integrity (OSI) at the National Institutes of Health is awaiting word on how its government lawyers will respond to its latest debacle, a US District Court ruling that OSI was created illegally and that its proceedings are therefore invalid.

OSI, in charge of investigating scientific misconduct by NIH grantees, has long been faulted for an egregiously torpid pace. To the frustration of accused and accusers, some cases have remained under inconclusive investigation for three or four years or longer. The judicial invalidation of OSI's very existence now adds an appropriately Kafkaesque touch to the story, with more to come very likely. OSI was faulted by the court only on the issue of the legality of its creation.

Rendered moot in the case was the separate issue of OSI's casual indifference to due process and basic rights of the targets of its inquiries. While the judge, Barbara A. Crabbe, stopped short of ruling on that matter, she included a number of caustic remarks in her decision concerning OSI's procedures.

The ruling applies at present only within the jurisdiction of the federal court for the Western District of Wisconsin, where it was delivered on December 28, with OSI's Justice Department lawyers given 60 days to appeal or let the decision stand. But as a result of the decision, considered soundly based by onlooking attorneys, the precedent is there for other courts ruling OSI non-existent throughout the land. That would raise uncertainties about the 70 or so scientific misconduct cases now on the OSI docket, along with the possibility that previously settled cases might be upset.

The government has two choices in this matter: One is an appeal, which is a chancy course since a loss would extend the reach of the ruling and give it further judicial weight. The other is to start over and re-establish OSI in accordance with the federal Administrative Procedure Act, which was ignored when regulations for what eventually became OSI were issued on an interim basis in 1986 and formally adopted last July. But that might entail long delays, perhaps a year or more, during which OSI could not legally proceed with ongoing investigations.

Under the Administrative Procedure Act, OSI's rules of procedure, and notification of intent to adopt them, should have been published in the *Federal Register* to provide interested parties an opportunity to comment—obligatory procedure when federal agencies seek to adopt new administrative regulations.

But, as Judge Crabbe noted in her opinion, the required publication did not take place. She dismissed NIH's contention that the publication requirement was fulfilled in 1989 with a *Federal Register* notice stating plans to adopt interim policies published in 1986 in the "NIH Guide for Grants and Contracts."

Lawyers who deal with OSI are understandably reluctant to comment openly on the legalistic candlepower devoted to the creation of NIH's so-called fraud squad, but the operation is not regarded as a great moment in western jurisprudence.

Though it is an $8 billion enterprise, NIH, astonishingly, possesses no legal counsel of its own. Its litigation is usually handled by the Justice Department, a standard procedure that's intended to let the federal government speak with one legal voice. NIH's routine legal needs are serviced by detailees from the Public Health Division of the Office of General Counsel in NIH's cabinet-level parent, the Department of Health and Human Services. Some see HHS's insistence on providing counsel as an effort to restrain NIH in its customarily direct and footloose dealings with Congress.

The case before Judge Crabbe was brought by James Abbs, Professor of Neurology and Neurophysiology at the University of Wisconsin, accused by a graduate student of falsifying data in a paper published in *Neurology* in 1987. Abbs, who held $2 million in NIH grants, was cleared by an inquiry convened by the university and NIH accepted the findings. But the accusations against Abbs persisted and in April 1988, NIH decided to conduct its own inquiry.

Proceeding in its customarily glacial manner, OSI notified Abbs early in 1990 that he was under investigation and that his name had been entered in the Public Health Service's computerized ALERT system, which notifies funding agencies of individuals under OSI scrutiny. The judge observed in her opinion that listing in the ALERT system is not likely to be promote success with federal funding agencies.

She also noted that on advice of counsel, Abbs refused to cooperate with an OSI "fact-gathering" team "when he was informed he would not be allowed to be present during interviews of other witnesses and would not have complete access to Office of Scientific Inquiry [sic] investigatory files." During the trial, Judge Crabbe described OSI's tactics as "embarrassing" and "the work of amateurs."

The due process issue, which is potentially more important for OSI than the question of the legality of its founding, did not get a thorough examination in the case. The judge noted Abbs' claim of "a right not to be labeled as having committed scientific misconduct without a determination that such misconduct has occurred, and that the creation of this right requires the government to provide due process protections." However, the decision went on to note that Abbs "does not develop this argument . . ." The Judge added that the right to compete for and retain research funding are protected by due process, but that "lesser sanctions" are within NIH's discretion.

NIH's record in the management of scientific misconduct is strewn with bizarre episodes. The celebrated "Baltimore case," involving allegations that a colleague of Nobelist David Baltimore fabricated data in a joint paper, first came to NIH's attention in 1986—and is still not re-

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. . .More In Print: Energy, START Verification, NOAA

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And on "If I had to do it over again, I would go into an area other than physics," 51 percent chose "strongly disagree" and 31 percent "disagree." Given these positive sentiments, is it really that bad out there?

Order from: APS, Office of Public Affairs, 2000 Florida Ave. NW, Washington, DC 20009; tel. 202/232-0189.

Energy in Developing Countries (GPO Stock No. 052-003-01219-7; 137 pp., $7, add 25 percent for international orders), by the Congressional Office of Technology Assessment, grapples with the politically sensitive issue of the industrialized world's mounting concern with soaring energy use and greenhouse gas effusions in the developing nations, now bound for what could be a tripling of consumption over the next 30 years. OTA stakes hope on new technologies that are both more economical and environmentally advantageous, but stresses that "the importance of factors other than technology must be recognized for the role they play in improving efficiencies. The policy environment in particular is crucial to the adoption of new technologies." Scheduled by OTA for publication next fall is a companion report on improved energy technologies, policy mechanisms for encouraging their adoption, and the federal role in transferring energy-efficient technologies.

Order from: USGPO, Superintendent of Documents, Washington, DC 20402-9325; tel. 202/783-3238.

Also from OTA: ***Verification Technologies: Measures for Monitoring Compliance With the START Treaty*** (OTA-ISC-479; 16 pp., no charge), unclassified summary of a report prepared for the Senate Foreign Relations and House Foreign Affairs Committees in anticipation of the now-shaky prospects for a Soviet-American treaty on nuclear weapons and various delivery systems. The report lists, without details, various on-site and remote means for monitoring compliance, starting with production facilities and extending to deployment. In releasing the summary, Senator John Kerry (D-Mass.) said the OTA study represented the first effort by Congress to obtain an independent assessment of verification technologies.

Order from: Office of Technology Assessment, Publishing Office, US Congress, Washington, DC 20510-8025; tel. 202/224-8996.

Environmental Data: Major Effort Is Needed to Improve NOAA's Data Management and Archiving (GAO/IMTEC-91-11; 63 pp., no charge), by the General Accounting Office (GAO), says the National Oceanic and Atmospheric Administration (NOAA) is slovenly in its care of millions of tapes, films, and paper records of environmental data. NOAA, the report charges, does not know "what is being retained, where it is located, and what data were lost." The GAO says NOAA officials report that "some early satellite data are lost, and that over half of the archived environmental data are suspect, damaged, or otherwise at risk." The report adds that "22 of 35 NOAA storage vaults were deficient in controls for fire, humidity, and water damage," and that some tapes were "stored in basements, dusty warehouses, and offices not designed for tape storage." The GAO said NOAA officials reported that attempts at remedial efforts have been thwarted by the Commerce Department, NOAA's parent agency, an assessment that GAO says was confirmed by the National Academy of Sciences Committee on Geophysical Data.

Also from GAO, a similar report about NASA: ***Space Operations: NASA Is Not Archiving All Potentially Valuable Data*** (GAO/IMTEC-91-3; 51 pp., no charge), which states that the space agency's "existing data archives are incomplete for many important missions and contain no data for others. "For 23 out of 37 important scientific missions, less than 60 percent of the required data was archived." The report states that NASA claims it's working on the problem.

Order from: USGAO, PO Box 6015, Gaithersburg, Md. 20877; tel. 202/275-6241.

Office of Scientific Integrity

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solved. After a report finding flaws in the paper was issued in 1989, NIH reopened the case. Many times over the past year, the OSI staff has said a follow-up, final report is just weeks away. At a Congressional hearing on the first report, NIH officials acknowledged that warm praise for the "whistleblower" in the case was present in the final draft, but was mysteriously absent from the published version [SGR, May 15, 1989: "Mystery of Missing Words"].

Last October, the Acting Director of NIH, William Raub, issued a wondrously opaque statement concerning the status of the inquiry into Robert Gallo's role in the identification of the AIDS virus. Raub's statement, drafted in consultation with OSI, led the *Washington Post* to report that NIH had "effectively cleared" Gallo. The *New York Times*, working from the same statement, reported that NIH had announced it would "open a full-scale investigation of possible misconduct" by Gallo [SGR, October 15, 1990: "NIH Speaks on Gallo Probe—And Sows Confusion"].

NIH took on its misconduct role very reluctantly, and only after Congress rejected the claim that the problem was too negligible to warrant serious attention. Science naturally polices itself, said the mandarins. But under political pressure NIH yielded and beefed up a previously drowsy office that eventually evolved into OSI. The result is a mess that warrants the prompt attention of the incoming Director, Bernadine Healy. What's clear is that OSI is not going to improve from within.—DSG

In Print: Grad Enrollments, US-Japan Ties, NIH Data

The publications listed are obtainable as indicated—not from SGR.

Selected Data on Graduate Students and Postdoctorates in Science and Engineering: Fall 1990 (NSF 90-324, 64 pp., no charge), latest statistical grist for the rising debate over whether serious shortages of trained manpower lie ahead. Compiled from NSF and NIH surveys of science and engineering departments in over 600 institutions, the report presents numbers without analysis or conclusions. Total 1989 graduate enrollments (masters and PhD) stood at 441,000, a one-year increase of 3 percent that continues a slow but steady increase from 329,600 in 1975. Computer enrollments soared (from 8400 to 33,000 over 1975-89) while earth sciences and agriculture were almost unchanged. Social science and psychology were the largest fields, with 27 percent of the total. Foreign students accounted for 23 percent of all enrollees, with the heaviest concentrations, over 40 percent of all students, in engineering, computer sciences, and mathematics. The bulk of the report consists of 25 tables covering enrollments by discipline, sources of support, geographic location, specific institutions, etc. Instructions are included for obtaining the data electronically and for more detailed reports on specific topics. The principal author of the report is J.G. Huckenpahler, Program Analyst in the NSF Division of Science Resources Study.

Order from: NSF, Division of Science Resources Studies, Room L-611, 1800 G St. NW, Washington, DC 20550; tel. 202/634-6082.

Scientific and Technical Relations Between the United States and Japan: Issues and Recommendations (33 pp., $5), from the anti-basher camp, the Commission on US-Japan Relations for the Twenty-First Century, an establishment body whose membership includes Lamar Alexander, the newly nominated US Secretary of Education, and Frank Press, President of the National Academy of Sciences (NAS), who is listed as author of the document. Sounded are the standard themes that both sides must try harder: Japan should spend more on basic research, open its labs wider to foreign visitors, and increase its handouts to American universities (a favorite theme of the Academy chief); the US should perform better at commercializing homegrown technologies, not blame Japan for economic adversity, expand Japanese language studies, etc. Included is an illuminating background paper on US-Japan scientific relations, by Martha Caldwell Harris, Director of the NAS Office of Japan Affairs.

Order from: Commission on US-Japan Relations for the Twenty-First Century, 1020 19th St. NW, #130, Washington, DC 20036; tel. 202/775-1697.

Drug Abuse and Drug Research: Third Triennial Report to Congress from the Secretary, Department of Health and Human Services (no charge), annual report, mandated by Congress, now available in brief executive summary, with orders being accepted for the full report (also no charge) scheduled for publication early in March. Listed in the table of contents are data on usage, including sedatives and anti-anxiety drugs, nicotine dependence, prevention and treatment research, and AIDS and intravenous drug abuse. (Survey data indicating a decline in drug use among high school students were released by HHS Secretary Louis Sullivan at press conference January 24.)

Order from: National Clearinghouse for Alcohol and Drug Information, PO Box 2345, Rockville, Md. 20852; tel. 1-800-729-6686.

From the National Institutes of Health Division of Research Grants (DRG), central point for grading NIH research applications, three closely related publications, all without charge, detailing the grim numbers and other matters in fine detail:

Extramural Trends: Fiscal Years: 1980-1989 (104 pp.), latest in the annual series reporting priority scores, award rates, current and constant dollar expenditures by institute and subject, indirect costs, etc.

DRG Peer Review Trends: Member Characteristics: 1979-1989 (200 pp.), resumption of a series last published in 1986, covers (without names) the disciplines, degrees, age levels, sex, homebases, etc., of members of NIH study sections, institute review groups, and advisory councils and boards.

DRG Peer Review Trends: Workload and Actions of DRG Study Sections: 1979-1989 (133 pp.), a new publication, focusing on and comparing the workloads, scores, approval rates of study sections, plus data on "investigator characteristics," including age and sex, degrees, etc.

Order from: NIH, Division of Research Grants, Westwood Building, Room 1A-15, Bethesda, Md. 20892; tel. 301/496-7561.

Their Most Productive Years: The American Physical Society Physics Planning Committee, Report on the 1990 Survey of Young Physics Faculty (17 pp., no charge), report of a survey of "the 939 physicists who received a PhD degree in 1980 or later and who are now on the faculty of one of the 175 physics PhD-granting departments in the US"—response rate 71 percent. Discouragement on the grant circuit was commonly reported, with appropriately gloomy comments, e.g., "It is frustrating to be told by referees that your proposals are brilliant; by grant officers that they will not be funded and by the university that you should be supporting more students." Also, "The funding situation is dismal." Nonetheless, on the statement "My career has gone pretty much in the direction I intended," 30 percent checked "strongly agree" and 45 percent "agree."

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